

Significant recent ornithological records from the limestone area of south-west Guangxi, south China, 2004–2012

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From 2004 to 2012, we conducted a long-term series of surveys of birds in 16 areas in the largely limestone area of south-west Guangxi, south China. A total of 304 bird species (192 resident, 44 summer visitors, 62 winter visitors and 6 passage migrants) were recorded, including seven globally threatened birds and 40 Chinese National Key Protected Animals. Fourteen species and seven subspecies were recorded for the first time in the area. The fauna of south-west Guangxi is similar to that of south Yunnan and Indochina. We suggest that Nonggang Babbler *Stachyris nonggangensis* and Oriental Pied Hornbill *Anthracoceros albirostris* are the priority flagship bird species for the region. Nonggang National Nature Reserve is the most important site in south-west Guangxi for the conservation of endemic birds in limestone areas, while Quyang Lake is very important for wintering waterbirds. Further surveys and studies are necessary for bird conservation in south-west Guangxi.

INTRODUCTION

The limestone area of south-west Guangxi Zhuang autonomous region (sometimes referred to as a province), one of the largest and most famous karst areas in the world, is in the Sino–Vietnamese border region. The area has been included in one of the 25 biodiversity hotspots of the world for conservation priority (Myers *et al.* 2000). Some nature reserves in this area are listed as Important Bird Areas (BirdLife International 2009). Three new bird species have been discovered in limestone forests of the region in recent years (Zhou & Jiang 2008, Woxvold *et al.* 2009, Alström *et al.* 2010). However, the overall extent and size of forested areas have been declining due to human disturbance (Wu 2009).

For such an important area, the avifauna of south-west Guangxi is still poorly known. The history of ornithological study in the region can be traced back to the 1930s (Chong 1932), but the first systematic bird survey of this area was carried out for the establishment of Nonggang National Nature Reserve in the 1980s (Long 1988). Regional surveys have been conducted and many new records have been reported in south-west Guangxi since the late 1990s (Chan & Lee 2006, Jiang *et al.* 2006, Lee *et al.* 2006, Robbins *et al.* 2006, Zhou

et al. 2011). Likewise knowledge of the avifauna of the adjacent areas in Vietnam is also lacking (Hill 2000, Pilgrim *et al.* 2009).

With support from many sources and international NGOs, we began a series of bird surveys from 2004 to 2012 to update the status and distribution in south-west Guangxi, and present the results here.

STUDY AREA AND METHODS

The largely limestone terrain of south-west Guangxi, including Daxin, Longzhou, Ningming, Chongzuo, Fusui, Jingxi, Napo and Pingxiang counties, covers about 21,300 km² and borders northern Vietnam (Figure 1). The climate is subtropical, with an average annual rainfall of 1,100–1,500 mm and annual average temperature 18–22°C. The native dominant vegetation types in this region are seasonal rain forest and mixed evergreen and deciduous broadleaved forest (Xū & Zhou 2011). The areas surveyed lie between about 100 m and 1,300 m. Most forests in the lowlands have been cleared for agriculture (mainly maize and sugarcane).

With help from other experienced birdwatchers we conducted bird surveys between 2004 and 2012 at 16 locations (Table 1). We

Table 1. Survey sites in south-west Guangxi, south China. Site areas obtained from Guangxi Forestry Bureau. NNR=National Nature Reserve, NR=Nature Reserve. All areas are limestone except for 14 & 15 which are partial limestone.

No. Site name	County	Area (km ²)	Geographical coordinates	Altitudinal range (m)	Years visited
1: Nonggang NNR	Longzhou, Ningming	101	22.467°N 106.830°E	150–650	2004–2012
2: Chunxiu NR	Longzhou	78	22.383°N 106.583°E	200–500	2007–2009
3: Qinglongshan NR	Longzhou	187	22.517°N 106.800°E	150–650	2008
4: Encheng NR	Daxin	299	22.733°N 107.100°E	200–400	2008
5: Xialei NR	Daxin	79	22.867°N 106.717°E	150–700	2006–2012
6: Bangliang NR	Jingxi	65	22.917°N 106.483°E	500–900	2005, 2008–2010
7: Gulongshan NR	Jingxi	296	22.983°N 106.683°E	250–700	2008
8: Dizhou NR	Jingxi	187	23.033°N 106.300°E	700–900	2008
9: Laohutiao NR	Napo	270	22.983°N 105.917°E	400–900	2006, 2008
10: Banli NR	Chongzuo	6	22.250°N 107.500°E	200–400	2006, 2008
11: Bapen NR	Fusui	12	22.483°N 107.867°E	100–300	2004, 2006, 2008
12: Longhushan NR	Long'an	3	22.950°N 107.633°E	100–400	2004, 2007, 2008
13: Daqingshan Botanical Garden	Pingxiang	4	22.100°N 106.750°E	200–300	2005, 2006
14: Xidamingshan NR	Fusui, Long'an, Daxin	600	22.833°N 107.833°E	200–900	2008–2012
15: Diding NR	Jingxi	9	23.100°N 105.967°E	700–1,300	2005–2007
16: Quyang Lake Reservoir	Jingxi	10	23.333°N 106.283°E	600–800	2008–2009

visited Nonggang National Nature Reserve (Nonggang NNR) every month from 2005 to 2007, and in the breeding season between 2008 and 2012. The number of visits to most other sites were more limited. Bird surveys were carried out using line transects and fixed point observations. We also used mist-netting to help investigate forest understorey birds. Waterbirds were mostly surveyed by direct counts in the winter. The specimen collections of the Forest Inventory and Planning Institute of Guangxi and the Institute of Biology, Guangxi Academy of Sciences, were searched for previously undocumented specimens. IUCN Red List status is according to BirdLife International (2013). Nomenclature and taxonomic order follows Inskipp *et al.* (1996) but includes species recognised since that time by the BirdLife Taxonomic Working Group.

RESULTS

A total of 304 bird species—192 resident, 44 summer visitors, 62 winter visitors and 6 passage migrants—were recorded during these surveys, including 7 globally threatened birds (2 Endangered, 2 Near Threatened, and 3 Vulnerable species) and 40 Chinese National Key Protected Animals (one in Class I and 39 in Class II). Fourteen species and seven subspecies were found in south-west Guangxi for the first time.

The Appendix lists the status and sites where each bird was observed.

The annotated list below gives details of significant records, including globally threatened species and those with range extensions.

Significant records

Ferruginous Pochard *Aythya nyroca*

Near Threatened. Two birds were seen on a seasonal pond near Nonggang NNR on 18 December 2008. In January 2009, one adult was also observed on Quyang Lake. These are the first records from south-west Guangxi.

Scaly-sided Merganser *Mergus squamatus*

Endangered. One bird was seen on Quyang Lake on 15 November 2008. The species had earlier been found on the coast of Guangxi in winter 1981 (Wu 1993). These records indicate a small number may winter in south Guangxi.

Speckled Piculet *Picumnus innominatus*

Least Concern. Speckled Piculet is common in Diding and Xidamingshan NRs. Three subspecies, *innominatus*, *chinensis* and *malayorum*, have been recorded in China (Cheng 1987, MacKinnon & Phillipps 2000). Specimens we collected from south-west Guangxi, with dark olive crown and yellow-green belly, were subspecies *malayorum*—the first for Guangxi and an eastern range extension.

Green-eared Barbet *Megalaima faiostricla*

Least Concern. This species has rarely been recorded in Guangzhou bay and Naozhou island (Cheng 1987, MacKinnon & Phillipps 2000). Three individuals and one nest were observed in Nonggang NNR between 2005 and 2011. These records help fill a gap in the species's range between Guangdong province and Indochina.

Oriental Pied Hornbill *Anthracoceros albirostris*

Least Concern. Common in south-west Guangxi 30 years ago (Wu

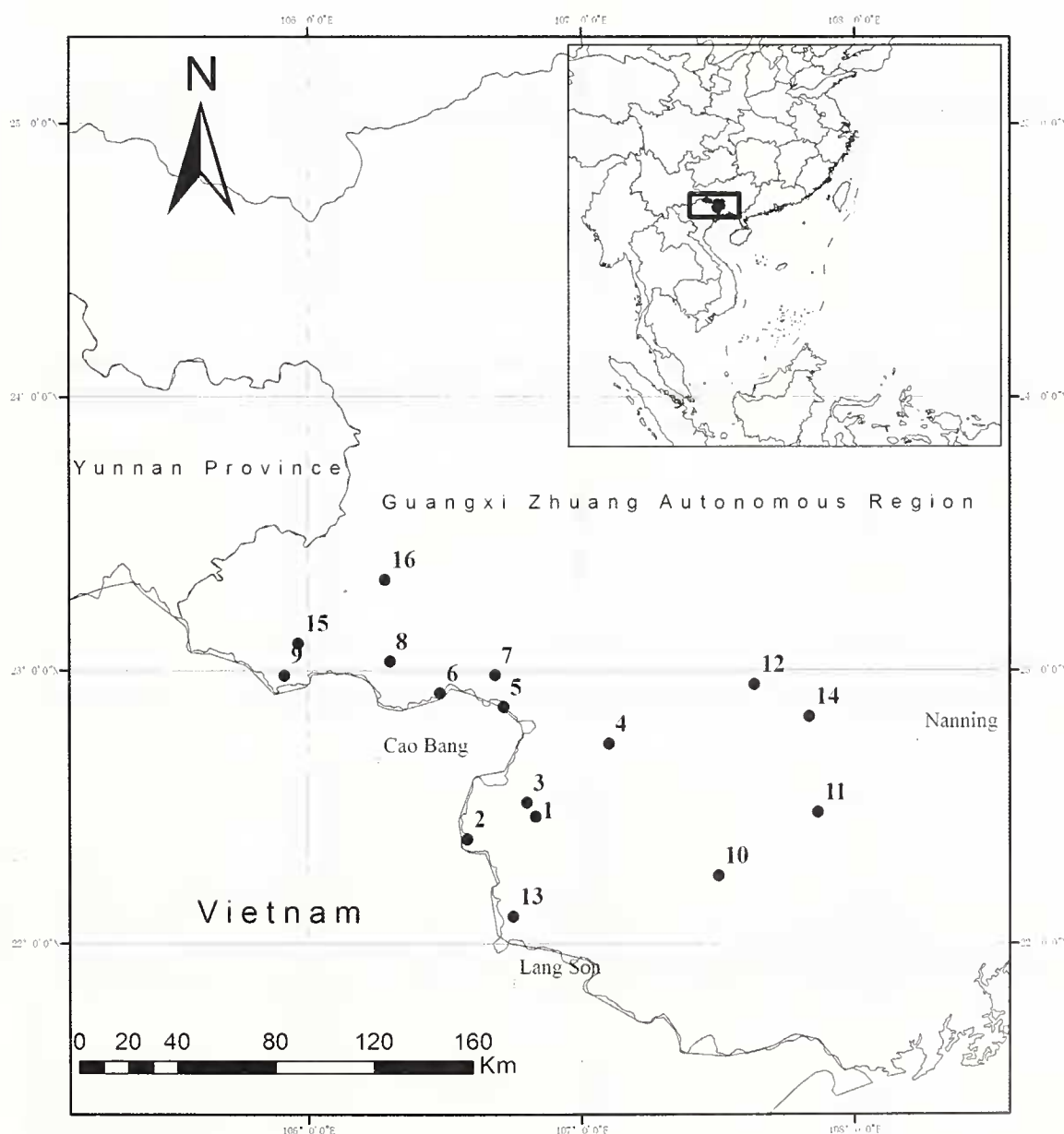


Figure 1. Map of survey locations in south-west Guangxi, south China. Site numbers correspond to Table 1.

1993). However, only two flocks were observed, in Nonggang NNR and Xidamingshan NR, between 2005 and 2009. This extreme north-eastern population of Oriental Pied Hornbill has declined rapidly in the last 30 years.

Blyth's Kingfisher *Alcedo hercules*

Near Threatened. First recorded in north-east Guangxi in 1998 (Lee *et al.* 2006). One pair was observed along a stream in Nonggang NNR in November 2007. It has also been observed in Diding NR (Robbins *et al.* 2006). These records for the limestone area of south-west Guangxi indicate a continuous distribution of this rare forest kingfisher.

Blue-bearded Bee-eater *Nyctyornis athertoni*

Least Concern. Although some authorities have stated that Blue-bearded Bee-eater was recorded in China only from Hainan, Xizang and Yunnan provinces (Cheng 1987, MacKinnon & Phillipps 2000), it is common in south-west Guangxi. Over 40 individuals and 5 nest burrows were observed in Nonggang, Xialei, Bangliang and Xidamingshan NRs from 2005 to 2012. It has already been recorded in Dayaoshan, central Guangxi (Zhou *et al.* 2011).

Asian Emerald Cuckoo *Chrysococcyx maculatus*

Least Concern. One pair was seen at Nonggang NNR on 15 June 2006. Another pair and one juvenile fostered by a White-throated Fantail *Rhipidura albicollis* were seen in Xidamingshan NR. The Asian Emerald Cuckoo was first recorded in Guangxi at Cenwanglaoshan NNR, north-west Guangxi (Kadoorie Farm & Botanic Garden 2003, Lee *et al.* 2006). These records indicate this small cuckoo may breed in forests throughout western Guangxi.

Barn Owl *Tyto alba*

Least Concern. Three individuals were observed in Nonggang NNR between 2005 and 2008. One specimen was also collected in Ningming county, south-west Guangxi, in January 2004 (Zhou *et al.* 2004). The species may also occur as vagrant in south Yunnan (MacKinnon & Phillipps 2000). These records, the most easterly in Guangxi, indicate an extension of the known range.

Thick-billed Green Pigeon *Treron curvirostra*

Least Concern. One seen on 24 August 2006 at Nonggang NNR, three in Encheng NR on 15 December 2008 and recorded in Xialei NR on 20 December 2008. This species is mostly seen in Yunnan and Hainan provinces in China (Cheng 1987, MacKinnon & Phillipps 2000).

Black-legged Kittiwake *Rissa tridactyla*

Least Concern. An adult was on Quyang Lake on 7 November 2009. This species has also been recorded in winter in Yunnan province (Zhao *et al.* 2009). This is the first record from Guangxi and a southern extension of the known wintering range in China.

Jerdon's Baza *Aviceda jerdoni*

Least Concern. This species was seen 12 times between 2005 and 2011 in three reserves. We also found a nest on a cliff in Nonggang NNR in May 2005. Contrary to MacKinnon & Phillipps (2000), who document few records only in Yunnan and Hainan provinces, it is common in limestone areas of Guangxi. It was also observed breeding in Liuzhou, central Guangxi (Zhou *et al.* 2011).

Oriental Honey Buzzard *Pernis ptilorhynchus*

Least Concern. A chick of this species was reared by local people in Xidamingshan NR in June 2009. Five juveniles were observed in Nonggang NNR and Longhushan NR in early summer 2005 and 2009. Thus breeding was confirmed in south-west Guangxi. Most Oriental Honey Buzzards breed in the eastern Palearctic and

winter in southern China and South-East Asia. The subspecies *ruficollis* breeds from India to Myanmar and in Sichuan and Yunnan provinces in western China. It is likely that birds breeding in south-west Guangxi are this race.

Red-necked Grebe *Podiceps grisegena*

Least Concern. The species has been recorded in Hebei, Fujian and Guangdong provinces in winter. Two adults were observed on a seasonal pond near Nonggang NNR on 18 December 2008. This record confirms that Red-necked Grebe also winters in south-west Guangxi.

White-eared Night Heron *Gorsachius magnificus*

Endangered. This species is very rare in south-west Guangxi. We have systematically searched for this nocturnal heron several times in the ponds and streams of south-west Guangxi, but we found only one adult, captured by a local fisherman on a stream in Xialei NR, in November 2005.

Black-throated Loon *Gavia arctica*

Least Concern. One adult was observed in winter on Quyang Lake on 17 January 2009. This record is the first for Guangxi. The species is usually considered a rare winter visitor to the coasts of Fujian, Jiangsu, Shandong and Taiwan (Cheng 1987, MacKinnon & Phillipps 2000, Zheng 2011). This record is also the first from freshwater ecosystems in south-west China.

Fairy Pitta *Pitta nympha*

Vulnerable. One pair was nesting on a rock in Nonggang NNR during June 2012. The species's distinctive song was also heard at Bangliang NR in May 2006.

Swinhoe's Minivet *Pericrocotus cantonensis*

Least Concern. Six individuals associating with Rosy Minivets *P. roseus* were observed at Nonggang NNR on 4 October 2005. Over 30 individuals were also seen in Bangliang, Banli and Diding NRs in the migration seasons between 2005 and 2009. South-west Guangxi may be an important migration corridor for the species.

Asian Paradise-flycatcher *Terpsiphone paradisi*

Least Concern. More than 30 individuals were seen, in Nonggang, Chunxiu, Dizhou, Xidamingshan and Diding NRs. The Asian Paradise-flycatcher in south-west Guangxi has a light grey throat similar to specimens collected from southern Yunnan province. We confirm it is the subspecies *indochinensis*, which breeds from south Yunnan to Thailand and Indochina (Cheng 1987). This is the first record of the subspecies *indochinensis* from Guangxi, and an eastward range extension.

Blue Whistling Thrush *Myophonus caeruleus*

Least Concern. Blue Whistling Thrush, subspecies *eugenei*, was found to be resident in Gulongshan, Laohutiao and Diding NRs. This subspecies is usually considered to occur in south-west China (MacKinnon & Phillipps 2000). Our records indicate an eastern extension of its range.

Brown-chested Jungle Flycatcher *Rhinomyias brunneata*

Vulnerable. Two individuals were seen at Nonggang NNR on 5 May 2006. One was recorded in Xidamingshan NR on 2 May 2009. The distinctive song was also heard in Bapen NR on 29 June 2012.

Hill Blue Flycatcher *Cyornis banyumas*

Least Concern. Although this species was previously considered a rare bird in China, distributed only in Sichuan, Guizhou and Yunnan provinces (MacKinnon & Phillipps 2000), it is common

in south-west Guangxi. We observed it breeding at 16 sites. It was also recorded in Gulongshan NR in 1999 (Lee *et al.* 2006).

Oriental Magpie Robin *Copsychus saularis*

Least Concern. This species is very common in south-west Guangxi. We compared specimens collected from south-west Guangxi and south China and confirmed that subspecies *erimelas* inhabits south-west Guangxi—an eastern range extension.

White-rumped Shama *Copsychus malabaricus*

Least Concern. The first Guangxi record of this species was from Chunxiu NR on 24 May 1998 (Lee *et al.* 2006). However, it is common in south-west Guangxi and we observed or heard it at most study sites. Two nests in dead bamboo were found at Nonggang NNR in May 2012.

Black-throated Tit *Aegithalos concinnus*

Least Concern. Common in Xidamingshan, Diding and Xialei NRs. The individuals seen had paler chestnut flanks and a narrower breast-band than those in north-east Guangxi and were confirmed to be subspecies *talifuensis*, recorded from Yunnan, Guizhou provinces and Indochina, extending its range to south-west Guangxi.

Flavescent Bulbul *Pycnonotus flavescens*

Least Concern. Recorded in Yunnan province (MacKinnon & Phillipps 2000, Zheng 2011). Over 40 individuals were seen in Diding NR between 2005 and 2007. Five were observed at Bangliang NR on 15 November 2008. These records are the first for Guangxi and an eastward range extension.

Pale-footed Bush Warbler *Cettia pallidipes*

Least Concern. Although the first record from Guangxi was only in Fusui in 1998 (Lee *et al.* 2006), this species was common in the grassland and farmland of south-west Guangxi. We observed or heard this bird in most areas during our surveys and its range has now extended to Liuzhou, central Guangxi (Zhou *et al.* 2011).

Limestone Leaf Warbler *Phylloscopus calciatilis*

Least Concern. This species was only recently described from the limestone area of Vietnam and Laos (Alström *et al.* 2010). It is very common in south-west Guangxi. We observed many individuals in Nonggang, Chunxiu, Qinglongshan, Banli and Bangliang NRs and one nest on a rock in Nonggang NNR in May 2012 during the surveys.

Yellow-bellied Warbler *Abroscopus superciliaris*

Least Concern. Although the first record in Guangxi was only in Chunxiu NR in 1998 (Lee *et al.* 2006), the species is common in bamboo forest in Nonggang, Chunxiu, Gulongshan, Encheng and Xialei NRs. Five nests were found in holes in bamboo in Nonggang NNR between 2010 and 2012. These records indicate an eastern extension of the range.

Red-tailed Laughingthrush *Garrulax milnei*

Least Concern. Rare in south-west Guangxi. Only 8 individuals were observed, in Diding NR, between 2005 and 2008. These were compared with the subspecies *sinianus* collected from north-east Guangxi, and it was confirmed that the south-west Guangxi birds were subspecies *sharpei*, recorded from south Yunnan province, north-west Thailand and north Indochina. These were the first records of *sharpei* from Guangxi and an eastern extension of its range.

Buff-breasted Babbler *Pellorneum tickelli*

Least Concern. Previously recorded in China only from Yunnan province (Cheng 1987, MacKinnon & Phillipps 2000), the species

was first recorded in Diding NR in 2004 (Robbins *et al.* 2006). We found it very common in south-west Guangxi—in Nonggang, Chunxiu, Qinglongshan, Encheng, Xialei NRs and Daqingshan Botanical Garden between 2005 and 2010. It was one of the most frequent mist-net captures in Nonggang NNR. These records for Guangxi indicate an eastern extension of its range.

Spot-throated Babbler *Pellorneum albiventre*

Least Concern. This species had been considered a resident in Tibet and Yunnan (Cheng 1987, MacKinnon & Phillipps 2000) and the first Guangxi record was collected in Nandan county, north-west Guangxi (Zhou *et al.* 1995). Five individuals were observed in Nonggang NNR between 2005 and 2009 and a nest with three eggs was found there in grassland in May 2008. Two were seen in Xidamingshan NR on 4 May 2009. It has also been observed in Shiwandashan and Diding NRs (Robbins *et al.* 2006). These records indicate a south-eastward extension of its range in China.

Rufous-fronted Babbler *Stachyris rufifrons*

Least Concern. Six individuals were seen in Nonggang NNR between 2005 and 2007, and two were observed in Diding NR on January 2006. The first Chinese record was of subspecies *adjuncta* in south Yunnan province (Yang & Yang 2004) and the Guangxi records are of this subspecies—an eastern extension to the range.

Nonggang Babbler *Stachyris nonggangensis*

Vulnerable. Nonggang Babbler is a recently described species collected from the Sino Vietnamese border region (Zhou & Jiang 2008). It is common in good protected limestone forest in Nonggang NNR and easy to detect by call. Over 200 different individuals were observed in Nonggang NNR every year from 2007 to 2012, but only three nests, in limestone holes, were found between 2009 and 2012. Some individuals were also found in Chunxiu NR and Bangliang NR on the Sino Vietnamese border, suggesting that a small population of Nonggang Babbler also inhabits limestone forest in northern Vietnam.

Rufous-backed Sibia *Heterophasia annectans*

Least Concern. This species was previously recorded from Tibet autonomous region and Yunnan province (Cheng 1987, MacKinnon & Phillipps 2000), but when we checked specimens in the Guangxi Forest Inventory and Planning Institute we found a Rufous-backed Sibia collected in Diding NR in March 1985. This is apparently the first record for Guangxi and an eastern range extension. This species was not seen in the field during the surveys.

Ashy-throated Parrotbill *Paradoxornis alphonsianus*

Least Concern. Four flocks of Ashy-throated Parrotbills were observed in Laohutiao and Diding NR between 2005 and 2008. The first record for Guangxi was seen in Xilin county, north-west Guangxi, in 2006 (Lu *et al.* 2006). These records fill a gap in the range between Yunnan and Guizhou provinces.

Grey Wagtail *Motacilla cinerea*

Least Concern. Grey Wagtail has been considered a winter visitor to southern China (Cheng 1987, MacKinnon & Phillipps 2000). However, over 30 individuals and one nest were seen in Nonggang, Encheng, Xialei, Diding and Xidamingshan NRs during the breeding season in 2005 to 2009. These records indicate a small population may be resident in south-west Guangxi, indicating a southern extension to its breeding range.

DISCUSSION

Composition of the avifauna

Based on our field surveys and published literature, a total 317 bird species, 304 seen during these surveys and 13 published earlier (Table 2), have been recorded from the limestone area of south-west Guangxi—23% of the Chinese bird list (Zheng 2011). Seven of these—White-eared Night Heron, Ferruginous Pochard, Scaly-sided Merganser, Blyth's Kingfisher, Fairy Pitta, Brown-chested Jungle-flycatcher and Nonggang Babbler—are Endangered, Vulnerable or Near Threatened species. Scaly-sided Merganser has also been ranked Class I in the List of Chinese National Key Protected Animals, while 39 other species are ranked Class II, including Red-necked Grebe, White-eared Night Heron, Greater Coucal *Centropus sinensis*, Lesser Coucal *C. bengalensis*, Long-tailed Broadbill *Psarisomus dalhousiae*, Silver-breasted Broadbill *Serilophus lunatus*, Blue-rumped Pitta *Pitta soror*, Fairy Pitta, and all Falconiformes and Strigiformes. These surveys have added fourteen species and seven subspecies to the bird list of either Guangxi as a whole or south-west Guangxi. They are: Black-throated Loon, Scaly-sided Merganser, Black-legged Kittiwake, Thick-billed Green Pigeon, Asian Emerald Cuckoo, Barn Owl, Green-eared Barbet, Swinhoe's Minivet, Flavescent Bulbul, Buff-breasted Babbler, Rufous-fronted Babbler, Rufous-backed Sibia, Ashy-throated Parrotbill, Limestone Leaf Warbler, subspecies *ruficollis* of Oriental Honey Buzzard, subspecies *malayorum* of Speckled Piculet, subspecies *erimelas* of Oriental Magpie Robin, subspecies *eugenei* of Blue Whistling Thrush, subspecies *indochinensis* of Asian Paradise-flycatcher, subspecies *sharpei* of Red-tailed Laughingthrush, and subspecies *talifuensis* of Black-throated Tit. Furthermore, several birds have been confirmed to breed in south-west Guangxi.

Our study and other recent surveys of south-west Guangxi have helped to fill in some gaps in the distribution of birds in south China. Historically, the fauna of south-west Guangxi has been considered part of the coastal subregion of Fujian, Guangdong and Guangxi provinces, with poorer biodiversity than the mountain subregion of south Yunnan province (Zhang 1999). However, the ranges of many birds recorded in Yunnan and Indochina extend into south-west Guangxi. According to incomplete statistics, of 236 breeding birds in our study, about 56 species and 10 subspecies have only

Table 2. Birds previously listed as occurring in the limestone area of south-west Guangxi (Zhou *et al.* 2011), but not detected in 2004–2012. Seasonal status assigned according to Zhou *et al.* (2011) and our observations in other areas of Guangxi. VU = Vulnerable species in IUCN Red List. * = Class II in the list of Chinese National Key Protected Animals.

Species	Seasonal status	Counties
*Mandarin Duck <i>Aix galericulata</i>	W	Ningming, Langzhou
Baikal Teal <i>Anas formosa</i>	W	Ningming
Lesser Yellow-nape <i>Picus chloralaphus</i>	R	Jingxi, Ningming, Langzhou, Daxin
Greater Yellow-nape <i>Picus flavinucha</i>	R	Jingxi, Langzhou, Daxin
Oriental Dwarf Kingfisher <i>Ceyx erithacus</i>	R	Ningming, Longzhou
*Blossom-headed Parakeet <i>Psittacula roseata</i>	R	Jingxi, Napo, Fusui, Ningming, Longzhou, Daxin
*Derbyan Parakeet <i>Psittacula derbiana</i>	R	Longzhou
*Red-breasted Parakeet <i>Psittacula alexandri</i>	R	Jingxi, Napo, Fusui, Ningming, Pingxiang, Langzhou, Daxin
Purple Swampphen <i>Parphyria parphyria</i>	R	Ningming
*Pied Falconet <i>Micrahierax melanaleucas</i>	R	Jingxi, Langzhou, Ningming, Daxin
*Pacific Reef Egret <i>Egretta sacra</i>	P	Ningming, Daxin
Silver Oriole <i>Oriolus mellianus</i> VU	S	Jingxi, Ningming, Long'an
*Hill Myna <i>Gracula religiosa</i>	R	Jingxi, Ningming, Pingxiang, Longzhou, Daxin

been recorded in south-west Guangxi, Yunnan and Indochina. For example, Lesser Racket-tailed Drongo *Dicrurus remifer* is observed in south-west Guangxi, south-east Tibet, Yunnan and South-East Asia. However, only five species, namely Fairy Pitta, Swinhoe's Minivet, Collared Finchbill *Spizixos semitorques*, Light-vented Bulbul *Pycnonotus sinensis* and Brown-chested Jungle Flycatcher, are recorded breeding only in south-west Guangxi and the forests of south-east China. Nonggang Babbler is even endemic to Sino-Vietnamese limestone (Shu *et al.* 2009) and two range-restricted vertebrates, Chinese Tiger Gecko *Goniurosaurus luii* and White-headed Langur *Presbytis leucocephalus* are also confined in China to the limestone area of south-west Guangxi, an important centre of biodiversity (Lee *et al.* 1999, Huang 2002). Therefore, we suggest that the fauna of the limestone area of south-west Guangxi should be considered as an independent subregion or part of the mountain subregion of Yunnan province and northern Vietnam.

Only a few bird surveys have been conducted in limestone areas of south China and Indochina in recent years (Long 1988, Duckworth *et al.* 1998, Chan *et al.* 2005, Robbins *et al.* 2006). Even so, these should be considered a special habitat type for birds. With its barren outcrops, depressions, numerous caves, plentiful underground water and little surface water this habitat is home to several endemic birds. Nonggang Babbler and Streaked Wren Babbler *Napothera brevicaudata*, mostly inhabiting and nesting in limestone areas, depend on limestone forests. Other more widespread species can adapt to this unique habitat. For example, Oriental Pied Hornbill, which mostly nests in tree holes in non-limestone areas, usually nests in limestone caves in Nonggang NNR. In addition, there are more ground and undergrowth specialists in limestone areas.

Conservation

The limestone area of south-west Guangxi and adjacent limestone highlands of northern Vietnam are important hotspots for the birds of south-west China and Indochina (Tordoff *et al.* 2007). Nonggang NNR is probably the most important site for the conservation of restricted-range birds in south-west Guangxi. Quyang Lake is very important for wintering waterbirds in south-west China. However, the avian population has decreased in the last 30 years. Thirteen species, including four waterbirds, eight forest birds and the Hill Myna, a very popular cage bird, have disappeared from south-west Guangxi in recent years due to forest loss, water pollution and poaching (Table 2). Eight of the lost species—Lesser Yellow-nape, Greater Yellow-nape, Blossom-headed Parakeet, Derbyan Parakeet, Red-breasted Parakeet, Pied Falconet, Silver Oriole and Hill Myna—are main hole nesters or species of mature forest. This indicates that forest loss and degradation, particularly the loss of large trees, is a major threat. In some nature reserves, although large in official area, vegetation is dominated by shrubland and secondary forest. Good protected limestone forests are only found in Nonggang NNR and a few inaccessible sites in other nature reserves. Furthermore, habitat fragmentation is very common in south-west Guangxi. Nonggang NNR, the largest and best limestone forest in south-west Guangxi, is divided into three sections by farmland, roads and rivers.

Most of the surveyed areas are officially protected by local government; however, improving management ability and developing a special bird conservation management plan are very important for every nature reserve. Ecological corridors are also important for threatened birds in fragment habitats. We suggest Nonggang Babbler and Oriental Pied Hornbill be regarded as flagship bird species for conservation priority in the region: the former is a specialised limestone species, while the latter, an extreme north-east population, is very important for seed dispersal and regeneration of limestone forest in south-west Guangxi.

Knowledge of the birds of these limestone areas is limited. The three recently discovered species and many new records in this area

are evidence of the inadequacy of past surveys. A lack of quantitative surveys limits our ability to understand population trends, while the ability to manage habitats for threatened birds is limited by many factors, including ecological knowledge. Therefore more specific surveys by skilled ornithologists, with detailed observations on habitat and ecological needs, are necessary for bird conservation in south-west Guangxi.

ACKNOWLEDGEMENTS

The authors thank the Guangxi Bureau of Forestry for permission to carry out these surveys. We also thank Gan Yang, Dehui Yang, Renjie Sun, Zhou Lu, Guidui Nong, Bo Zhao and Wenqing Zhao for their help in the field, and Mike Cline for help with editing. John Fellowes provided valuable comments on an earlier draft. This work was supported by grants from Hong Kong's Kadoorie Farm and Botanic Garden, the National Natural Science Foundation of China (No.30360012, 30970381 and 31172123) and Guangxi Zhuang Autonomous Region (2010GXNSFB013044). The survey was also partly funded by a small science grant from the Nature Reserve Management Enhancement Component of the Guangxi Integrated Forest Development and Conservation Project (GXGEF200804), the China Programme Office of Fauna & Flora International.

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Appendix.

Birds recorded in south-west Guangxi during 2004–2012.

Species	IUCN Red List status ¹	China			Species	IUCN Red List status ¹	China		
		Protected status ²	Seasonal status ³	Sites ⁴			Protected status ²	Seasonal status ³	Sites ⁴
Chinese Francolin <i>Fringilla pinnata</i>			R	1–15	Kentish Plover <i>Chorodrius alexandrinus</i>			W	1,16
Bar-backed Partridge <i>Arborophila brunnepectus</i>			R	1,3,5–9	Northern Lapwing <i>Vanellus vanellus</i>			W	1,16
Mountain Bamboo Partridge <i>Bombusicala fytchii</i>			R	14,15	Grey-headed Lapwing <i>Vanellus cinereus</i>			W	1,16
Red Junglefowl <i>Gallus gallus</i>		II	R	1–15	Black-headed Gull <i>Larus ridibundus</i>			W	16
Silver Pheasant <i>Lophura nycthemera</i>		II	R	1–12,14,15	Black-legged Kittiwake <i>Rissa tridactyla</i>			W	16
Common Pheasant <i>Phasianus colchicus</i>			R	5,7,6	Jerdon's Baza <i>Aviceda jerdoni</i>		II	R	1,2,14
Lesser Whistling-duck <i>Dendrocygna javonica</i>			R	1,16	Black Baza <i>Aviceda leuphates</i>		II	S	1–16
Mallard <i>Anas platyrhynchos</i>			W	16	Oriental Honey Buzzard <i>Pernis ptilorhynchus</i>		II	S	1,12,14
Spot-billed Duck <i>Anas platyrhynchos</i>			W	16	Black-shouldered Kite <i>Elanus caeruleus</i>		II	R	1,10,14,16
Common Teal <i>Anas crecca</i>			W	1,4,16	Black Kite <i>Milvus migrans</i>		II	R	1–15
Ferruginous Pachard <i>Aythya nyroca</i>	NT		W	1,16	Crested Serpent Eagle <i>Spilornis cheelo</i>		II	R	1–15
Scaly-sided Merganser <i>Mergus squamatus</i>	EN	I	W	16	Crested Goshawk <i>Accipiter trivirgatus</i>		II	R	1–15
Barred Buttonquail <i>Turnix susciatar</i>			R	1–5,14	Shikra <i>Accipiter badius</i>		II	R	1,5,6,14
Eurasian Wryneck <i>Jynx torquilla</i>			P	1,16	Chinese Sparrowhawk <i>Accipiter salaensis</i>		II	S	14
Speckled Piculet <i>Picumnus innominatus</i>			R	14,15	Eurasian Sparrowhawk <i>Accipiter nisus</i>		II	W	1
White-browed Piculet <i>Sasia achroea</i>			R	1–15	Common Buzzard <i>Buteo butea</i>		II	W	1,3,14–16
Grey-capped Pygmy Woodpecker <i>Dendrocopos conicopillus</i>			R	6,14	Banelli's Eagle <i>Hieroaetus fuscicatus</i>		II	R	1,4,6
Rufous-bellied Woodpecker <i>Dendrocopos hyperythrus</i>			R	14,15	Mountain Hawk Eagle <i>Spizoceros nipolensis</i>		II	R	1,4,6,14
Great Spotted Woodpecker <i>Dendrocopos major</i>			R	3,14,15	Common Kestrel <i>Falco tinnunculus</i>		II	R	1–16
Rufous Woodpecker <i>Ceolus brochyrus</i>			R	1–15	Eurasian Hobby <i>Falco subbuteo</i>		II	S	6
Bay Woodpecker <i>Blythipicus pyrrhotis</i>			R	1,5–9,14,15	Oriental Hobby <i>Falco severus</i>		II	R	1,2
Green-eared Barbet <i>Megalaima faiastrica</i>			R	1	Peregrine Falcon <i>Falco peregrinus</i>		II	W	16
Golden-throated Barbet <i>Megalaima franklinii</i>			R	15	Little Grebe <i>Tachybaptus ruficollis</i>			R	1–16
Blue-throated Barbet <i>Megalaima osiatica</i>			R	1,9,12–15	Red-necked Grebe <i>Podiceps grisegena</i>		II	W	1,16
Oriental Pied Hornbill <i>Anthracoceros albirostris</i>			R	1,12,14	Great Crested Grebe <i>Podiceps cristatus</i>			W	16
Common Hoopoe <i>Upupa epops</i>			R	1,9,14,15,16	Little Egret <i>Egretta garzetta</i>			R	1–7,14–16
Red-headed Tragon <i>Horopoctes erythrocephalus</i>			R	1–12,13–16	Grey Heron <i>Ardea cinerea</i>			W	16
Dollarbird <i>Eurystomus orientalis</i>			S	1–16	Purple Heron <i>Ardea purpurea</i>			W	16
Blyth's Kingfisher <i>Alcedo hercules</i>	NT		R	1	Great Egret <i>Cosmerodius albus</i>			W	16
Common Kingfisher <i>Alcedo atthis</i>			R	1–16	Cattle Egret <i>Bubulcus ibis</i>			R	1–5,9–16
White-throated Kingfisher <i>Holcyon smyrnensis</i>			R	1–16	Chinese Pond Heron <i>Ardeola bacchus</i>			R	1–16
Black-capped Kingfisher <i>Holcyon pileata</i>			R	1,14–16	Little Heron <i>Butorides striatus</i>			R	1–5,9–16
Crested Kingfisher <i>Megaceryle lugubris</i>			R	16	Black-crowned Night Heron <i>Nycticorax nycticorax</i>			R	14–16
Pied Kingfisher <i>Ceryle rudis</i>			R	1,16	White-eared Night Heron <i>Gorsachius magnificus</i>	EN	II	R	5
Blue-bearded Bee-eater <i>Nyctornis othertoni</i>			R	1,5,6,14	Malayan Night Heron <i>Gorsachius melanolephus</i>			S	1–3,7,14
Chestnut-winged Cuckoo <i>Clomator coromandus</i>			S	14	Yellow Bittern <i>Ixobrychus sinensis</i>			S	16
Large Hawk Cuckoo <i>Hierococcyx sporverioides</i>			S	13–15	Cinnamon Bittern <i>Ixobrychus cinnomomeus</i>			S	16
Indian Cuckoo <i>Cuculus micropterus</i>			S	1,2,13–15	Great Bittern <i>Botaurus stelloris</i>			W	16
Banded Bay Cuckoo <i>Coccyzus sonnerotii</i>			S	1	Black-throated Loon <i>Gavia arctica</i>			W	16
Plaintive Cuckoo <i>Coccyzus merulinus</i>			S	1–15	Blue-rumped Pitta <i>Pitta sorar</i>		II	R	1,2
Asian Emerald Cuckoo <i>Chrysococcyx maculatus</i>			S	1,6,14	Fairy Pitta <i>Pitta nympha</i>	VU	II	S	1,6
Dronga Cuckoo <i>Surniculus lugubris</i>			S	1,14	Silver-breasted Broadbill <i>Serilophus lunatus</i>		II	R	15
Asian Kael <i>Eudynamis scalopocea</i>			S	1–15	Long-tailed Broadbill <i>Psalisomus dalhousiae</i>		II	R	1–9,14,15
Green-billed Malkoha <i>Phoenicophoeus tristis</i>			R	1–15	Orange-bellied Leafbird <i>Chloropsis hardwickii</i>			R	1,3,6,14,15
Greater Coucal <i>Centropus sinensis</i>		II	R	1–16	Brown Shrike <i>Lanius cristatus</i>			W	1–16
Lesser Coucal <i>Centropus bengolensis</i>		II	S	1–16	Burmese Shrike <i>Lanius calluriaides</i>			W	1–16
Asian Palm Swift <i>Cypsiurus bolosiensis</i>			R	1–10	Long-tailed Shrike <i>Lanius schiech</i>			R	1–16
Fork-tailed Swift <i>Apus pacificus</i>			S	1–5,8	Grey-backed Shrike <i>Lanius tephronotus</i>			W	5,6,15
Hause Swift <i>Apus affinis</i>			S	1–15	Eurasian Jay <i>Garrulus glandarius</i>			R	14,15
Barn Owl <i>Tyto alba</i>		II	R	1	Red-billed Blue Magpie <i>Urocissa erythrorhynchos</i>			R	13–15
Oriental Bay Owl <i>Phadilus bodius</i>		II	R	1,5,9	White-winged Magpie <i>Urocissa whiteheadi</i>			R	1–9,14
Callared Scops Owl <i>Otus bokkamaeno</i>		II	R	1–16	Indochinese Green Magpie <i>Cisso hypoleuco</i>			R	1–6
Brown Wood Owl <i>Strix leptogrammica</i>		II	R	1,14	Grey Treepie <i>Dendrocitta formosae</i>			R	14,15
Collared Owlet <i>Glucidium brodiei</i>		II	R	1–15	Black-billed Magpie <i>Pica pica</i>			R	6,9,15
Asian Barred Owlet <i>Glucidium cuculoides</i>		II	R	1–16	Large-billed Crow <i>Corvus macrorhynchos</i>			R	1–16
Brown Hawk Owl <i>Ninox scutulata</i>		II	R	1,3,4,14	Ashy Woodswallow <i>Artamus leucorhynchus</i>			R	1–3
Short-eared Owl <i>Asia flammeus</i>		II	W	1	Black-naped Oriole <i>Oriolus chinensis</i>			S	1–15
Grey Nightjar <i>Coprimulgus indicus</i>			S	1–3,12–15	Black-winged Cuckooshrike <i>Corocina meloschistos</i>			S	1–8,14,15
Oriental Turtle Dove <i>Streptopelia orientalis</i>			R	14–16	Rosy Minivet <i>Pericrocotus roseus</i>			S	1,6,10,15
Spotted Dove <i>Streptopelia chinensis</i>			R	1–16	Swinhoe's Minivet <i>Pericrocotus cantanensis</i>			S	1,6,10,15
Barred Cuckoo <i>Dave Mocyprygio uncholl</i>		II	R	1	Ashy Minivet <i>Pericrocotus divoricatus</i>			P	1,14
Emerald Dove <i>Chalcophaps indica</i>			R	1–15	Grey-chinned Minivet <i>Pericrocotus solaris</i>			R	1–15
Thick-billed Green Pigeon <i>Treron curvirostris</i>		II	R	1,4,5	Lang-tailed Minivet <i>Pericrocotus ethologus</i>			S	1,14,15
White-bellied Green Pigeon <i>Treron sieboldii</i>		II	R	1,14	Short-billed Minivet <i>Pericrocotus brevirostris</i>			S	15
Mountain Imperial Pigeon <i>Ducula badia</i>		II	R	11	Scarlet Minivet <i>Pericrocotus flammeus</i>			R	1–15
Slaty-breasted Rail <i>Gallinula striatula</i>			R	1,4,12,14,16	Bar-winged Flycatcher-shrike <i>Hemipus picotus</i>			R	1–9,14,15
Brown Crake <i>Amourornis ooloo</i>			R	1,2,4,5,16	White-throated Fantail <i>Rhipidura olbilcollis</i>			R	1–15
White-breasted Waterhen <i>Amourornis phoenicurus</i>			R	1–16	Black Drongo <i>Dicrurus mocrocerus</i>			P	1–16
Watercock <i>Gallinula cinerea</i>			S	1,16	Ashy Drongo <i>Dicrurus leucophaeus</i>			S	14,15
Common Moorhen <i>Gallinula chloropus</i>			R	1,14,16	Crow-billed Drongo <i>Dicrurus annectans</i>			S	1–9
Common Coot <i>Fulica atra</i>			W	16	Bronzed Drongo <i>Dicrurus oeneus</i>			S	1,4,6
Eurasian Woodcock <i>Scolopax rusticola</i>			W	1,14,15	Lesser Racket-tailed Drongo <i>Dicrurus remifer</i>			S	1,6
Eurasian Curlew <i>Numenius arquata</i>			W	1,16	Spangled Drongo <i>Dicrurus hottentottus</i>			S	1–15
Common Sandpiper <i>Actitis hypoleucos</i>			R	1,2,4–7,16	Black-naped Monarch <i>Hypothymis ozureo</i>			S	1–16
Black-winged Stilt <i>Himantopus himantopus</i>			W	1,16	Asian Paradise-flycatcher <i>Terpsiphone porodisi</i>			S	1,2,8,14,15
Pacific Golden Plover <i>Pluvialis fulva</i>			W	16	Large Waadshrike <i>Tephrodornis gulorini</i>			R	1,6,14,15
Little Ringed Plover <i>Chorodrius dubius</i>			W	16	Blue Rock Thrush <i>Monticola salitarius</i>			R	1–16

Species	IUCN	China	Seasonal status ³	Sites ⁴	Species	IUCN	China	Seasonal status ³	Sites ⁴
	Red List status ¹	Protected status ²				Red List status ¹	Protected status ²		
Blue Whistling Thrush <i>Myophonus coeruleus</i>			R	7,9,14	Common Tailorbird <i>Orthotomus sutarius</i>			R	1-16
Orange-headed Thrush <i>Zoothera citrino</i>			S	14,15	Dark-necked Tailorbird <i>Orthotomus otragularis</i>			R	1-3
Scaly Thrush <i>Zoothera dauma</i>			W	1,14,15	Dusky Warbler <i>Phylloscopus fuscotus</i>			W	1,5,6,12-16
Grey-backed Thrush <i>Turdus hortulorum</i>			W	14,15	Pallas's Leaf Warbler <i>Phylloscopus praregulus</i>			W	1-16
Black-breasted Thrush <i>Turdus dissimilis</i>			R	15	Yellow-browed Warbler <i>Phylloscopus inornatus</i>			W	1-16
Japanese Thrush <i>Turdus cardis</i>			W	1,4,14,15	Arctic Warbler <i>Phylloscopus borealis</i>			W	1-16
Eurasian Blackbird <i>Turdus merula</i>			R	1-15	Greenish Warbler <i>Phylloscopus trachiloides</i>			W	1-15
Brown-chested Jungle Flycatcher <i>Rhinomyias brunneata</i>	VU		S	1	Eastern Crowned Warbler <i>Phylloscopus caranotus</i>			W	1-15
Dark-sided Flycatcher <i>Muscicopa sibirico</i>			W	1-16	Blyth's Leaf Warbler <i>Phylloscopus reguloides</i>			S	1-15
Asian Brown Flycatcher <i>Muscicapa dauurica</i>			W	1-16	White-tailed Leaf Warbler <i>Phylloscopus dovisoni</i>			R	1
Ferruginous Flycatcher <i>Muscicopa ferruginea</i>			W	1,15	Limestone Leaf Warbler <i>Phylloscopus colciotilis</i>			R	1-3,6,10,
Yellow-rumped Flycatcher <i>Ficedula zonthopygia</i>			P	1-15	Golden-spectacled Warbler <i>Seiurus burkii</i>			W	1,14,15
Mugimaki Flycatcher <i>Ficedula mugimaki</i>			W	1-3	White-spectacled Warbler <i>Seiurus affinis</i>			R	1-5,15
Rufous-gorgeted Flycatcher <i>Ficedula strophoto</i>			S	1-5	Chestnut-crowned Warbler <i>Seiurus costoniceps</i>			W	1-15
Snowy-browed Flycatcher <i>Ficedula hyperythra</i>			R	1-15	Broad-billed Warbler <i>Tickellio hadgsani</i>			R	1
Blue-and-white Flycatcher <i>Cyanoptilo cyanomelano</i>			P	1,3,5,14	Yellow-bellied Warbler <i>Abracoscopus superciliaris</i>			R	1-5
Verditer Flycatcher <i>Eumyias tholossino</i>			R	1-16	Black-throated Laughingthrush <i>Gorrorox chinensis</i>			R	1,4,8
Large Niltava <i>Niltava grandis</i>			R	9,15	Hwamei <i>Garrulax canarus</i>			R	1-16
Small Niltava <i>Niltava macgrigarioe</i>			R	1,6-9,15	White-browed Laughingthrush <i>Garrulox sonnia</i>			R	1-16
Fujian Niltava <i>Niltava davidi</i>			R	1-9,15	Red-tailed Laughingthrush <i>Gorrorox milnei</i>			R	15
Hainan Blue Flycatcher <i>Cyornis hoinonus</i>			S	1-16	Red-faced Liocichla <i>Liocichla phaenicea</i>			R	15
Pale Blue Flycatcher <i>Cyornis unicolor</i>			S	14	Buff-breasted Babbler <i>Pellorneum tickelli</i>			R	1-5,13
Hill Blue Flycatcher <i>Cyornis banyumos</i>			S	1,5,6	Spot-throated Babbler <i>Pellorneum albiventre</i>			R	1,14
Grey-headed Canary Flycatcher <i>Culicicapa ceylanensis</i>			R	1-15	Large Scimitar Babbler <i>Pomatorhinus hypoleucus</i>			R	1-9
Rufous-tailed Robin <i>Luscinia sibilans</i>			W	1,14,15	Streak-breasted Scimitar Babbler <i>Pamatarhinus ruficallis</i>			R	1-16
Bluethroat <i>Luscinia svecica</i>			W	1,2	Streaked Wren Babbler <i>Napothero brevicoudota</i>			R	1-15
Orange-flanked Bush Robin <i>Torsiger cyonurus</i>			W	1-16	Pygmy Wren Babbler <i>Pnaeyga pusilla</i>			R	6-9
Oriental Magpie Robin <i>Copsychus saularis</i>			R	1-16	Rufous-fronted Babbler <i>Stochyris rufifrans</i>			R	1,15
White-rumped Shama <i>Copsychus moloboricus</i>			R	1-9,13	Rufous-capped Babbler <i>Stochyris ruficeps</i>			R	1-16
Daurian Redstart <i>Phoenicurus aureus</i>			W	1-16	Golden Babbler <i>Stochyris chrysoeo</i>			R	2,3,13
White-capped Water Redstart <i>Chaimorrarnis leucacephalus</i>			W	15	Grey-throated Babbler <i>Stochyris nigriceps</i>			R	1-9
Plumbeous Water Redstart <i>Rhyacornis fuliginasus</i>			R	2-5,14,15	Spot-necked Babbler <i>Stochyris striolata</i>			R	1,5,6
White-tailed Robin <i>Myiameia leucura</i>			R	1-6,13-15	Nangang Babbler <i>Stochyris nangangensis</i>	VU		R	1,2,6
Slaty-backed Forktail <i>Enicurus schistocetus</i>			R	14,15	Striped Tit Babbler <i>Mocronous gularis</i>			R	1-9,15
White-crowned Forktail <i>Enicurus leschenoulti</i>			R	4,5,14,15	Chestnut-capped Babbler <i>Timolia pileoto</i>			R	1,10-14
Common Stonechat <i>Saxicola torquata</i>			W	1-16	Yellow-eyed Babbler <i>Chrysommo sinense</i>			R	1,10-14
Grey Bushchat <i>Saxicola ferrea</i>			R	1-16	Silver-eared Mesia <i>Leithrix argentauris</i>			R	1,5-7,14-15
Crested Myna <i>Acridotheres cristatellus</i>			R	1-16	Red-billed Leithrix <i>Leithrix lutea</i>			R	14,15
Red-billed Starling <i>Sturnus sericeus</i>			R	1,15	Spectacled Barwing <i>Actinoduro romsoyi</i>			R	5,6,15
White-cheeked Starling <i>Sturnus cinerocetus</i>			W	1-5,13	Blue-winged Minla <i>Minlo cyanoouptero</i>			R	5,6,14,15
Black-collared Starling <i>Sturnus nigricollis</i>			R	15,16	Rusty-capped Fulvetta <i>Alcippe dubio</i>			R	15
Velvet-fronted Nuthatch <i>Sitta frontalis</i>			R	1,6,14,15	Grey-cheeked Fulvetta <i>Alcippe marrisonia</i>			R	1-16
Great Tit <i>Parus major</i>			R	1-16	Rufous-backed Sibia <i>Heterophasio onnectans</i>			R	15
Green-backed Tit <i>Porus monticalus</i>			R	1,15	Black-headed Sibia <i>Heterophasia melanaleuca</i>			R	14,15
Sultan Tit <i>Melanochlora sultonea</i>			R	1-9	Striated Yuhina <i>Yuhina costoniceps</i>			R	1-15
Black-throated Tit <i>Aegithalos concinnus</i>			R	5,14,15	White-bellied Yuhina <i>Erpornis zontholeuco</i>			R	1-15
Sand Martin <i>Riporia riporia</i>			W	1	Spot-breasted Parrotbill <i>Poradoxornis guttaticallis</i>			R	15
Dusky Crag Martin <i>Hirundo cancalor</i>			R	1,4,6	Ashy-throated Parrotbill <i>Poradoxornis olphonsionus</i>			R	9,15
Barn Swallow <i>Hirundo rustica</i>			S	1-16	Plain Flowerpecker <i>Oicoeum concolor</i>			R	1-16
Red-rumped Swallow <i>Hirundo daurica</i>			S	1-16	Fire-breasted Flowerpecker <i>Oicoeum ignipectus</i>			R	14,15
Collared Finchbill <i>Spizixas semitarques</i>			R	6,14,15	Scarlet-backed Flowerpecker <i>Oicoeum cruentotum</i>			R	1-5
Black-crested Bulbul <i>Pycnonotus melanocterus</i>			R	1-15	Olive-backed Sunbird <i>Nectarinia jugularis</i>			R	1-16
Red-whiskered Bulbul <i>Pycnonotus jocosus</i>			R	1-16	Mrs Gaudl's Sunbird <i>Aethopyga gaudioe</i>			R	6,15
Brown-breasted Bulbul <i>Pycnonotus xanthorrhous</i>			R	14,15	Fork-tailed Sunbird <i>Aethopyga christinoe</i>			R	1-16
Light-vented Bulbul <i>Pycnonotus sinensis</i>			R	1-16	Black-throated Sunbird <i>Aethopyga saturata</i>			R	6,15
Sooty-headed Bulbul <i>Pycnonotus aurigaster</i>			R	1-16	Little Spiderhunter <i>Arachnothero longirostro</i>			R	1,15
Flavescent Bulbul <i>Pycnanotus flovescens</i>			R	6,15	Streaked Spiderhunter <i>Arachnathera magna</i>			R	1,4,6,15
Puff-throated Bulbul <i>Alophoixus pollidus</i>			R	1-15	Russet Sparrow <i>Passer rutilans</i>			R	6-9,15,16
Grey-eyed Bulbul <i>Iole propinquo</i>			R	1-5	Eurasian Tree Sparrow <i>Passer montonus</i>			R	1-16
Mountain Bulbul <i>Ixos mcdellandii</i>			R	1-15	Forest Wagtail <i>Oendronanthus indicus</i>			P	1,4,14,15
Chestnut Bulbul <i>Hemixos costonotus</i>			R	1-15	White Wagtail <i>Matacilla alba</i>			R	1-16
Black Bulbul <i>Hypsipetes leucacephalus</i>			R	1-15	Yellow Wagtail <i>Matacilla flava</i>			P	16
Hill Prinia <i>Prinio otrogularis</i>			R	1-16	Grey Wagtail <i>Motacilla cinerea</i>			R	1,4,5,14,15
Rufescent Prinia <i>Prinia rufescens</i>			R	1-3	Richard's Pipit <i>Anthus richardi</i>			W	16
Grey-breasted Prinia <i>Prinia hodgsanii</i>			R	1-6,15	Olive-backed Pipit <i>Anthus hadgsani</i>			W	1-16
Yellow-bellied Prinia <i>Prinio floventris</i>			R	1-16	White-rumped Munia <i>Lanchuro strioto</i>			R	1-16
Plain Prinia <i>Prinio inornoto</i>			R	1-16	Scaly-breasted Munia <i>Lonchuro punctulota</i>			R	1-16
Oriental White-eye <i>Zosterops polpebrus</i>			R	1-16	Brambling <i>Fringillo montifringillo</i>			W	1-3,14
Japanese White-eye <i>Zosterops japonicus</i>			R	1-16	Grey-capped Greenfinch <i>Corduelis sinica</i>			R	1-16
Grey-bellied Tesia <i>Tesio cyaniventer</i>			R	1,6,15	Common Rosefinch <i>Carpadocus erythrinus</i>			W	1,5,6,14-16
Asian Stubtail <i>Urospheno squameiceps</i>			W	1,5,15	Yellow-billed Grosbeak <i>Eophono migratoria</i>			W	1,13,14
Pale-footed Bush Warbler <i>Cettia pallidipes</i>			R	1-13	Crested Bunting <i>Melophus lothami</i>			R	1-16
Brownish-flanked Bush Warbler <i>Cettia fartipes</i>			R	1-16	Little Bunting <i>Emberizo pusillo</i>			W	1-9
Spotted Bush Warbler <i>Brodypterus tharocicus</i>			R	1	Chestnut Bunting <i>Emberizo rutilo</i>			W	1-9,15
Mountain Tailorbird <i>Orthotomus cuculotus</i>			R	1-15	Black-faced Bunting <i>Emberiza spadocephalo</i>			W	10-14

1 EN = Endangered, VU = Vulnerable, NT = Near Threatened

2 I and II: Class in the list of Chinese National Key Protected Animals.

3 Seasonal status most commonly applicable according our observations. R: resident, S: summer visitor, W: winter visitor, P: passage migrant.

4 Sites correspond to those listed in Table 1.